

Remarks:

Examiner's Position

Specification

The Examiner has objected to the product amounts for Example 2 as not including a basis for the percentages. The product amounts have been amended to reflect the basis for the percentages in the product. Support for this amendment is found in the Specification at pp. 26-27 in Examples 1, 1A and 2A which disclose the product in weight percent.

The Examiner has objected to the abstract of the disclosure as not reflecting Claim 1. The Examiner has also objected to the inventions of Claims 24-27 as not being described in the abstract. The abstract has been amended to reflect Claim 1 as well as the inventions described in Claims 24-27. Support for this amendment is found in originally presented Claims 1 and 24.

Disposition of the Claims

The Examiner has objected to Claim 5 because of informalities, namely the misspelling of "alkylvinylidene." Claim 5 has been amended to correct the spelling of alkylvinylidene.

The Examiner has rejected Claim 24 under 35 U.S.C. 102(b) as being anticipated by Harrison et al., WO 01/70830A2. Claim 24 has been amended. Support for the amendment is found at p. 19 of the Specification.

The Examiner has rejected Claims 25-27 under 35 U.S.C. 103(a) as being unpatentable over Harrison et al., WO 01/70830A2, as applied to Claim 24 above, and further in view of the disclosures the '830 Published Patent Application.

The Examiner has rejected Claims 1-23 under 35 U.S.C. 103(a) as being unpatentable over Harrison et al., WO 01/70830A2. Claim 1 has been amended. Support for the amendment is found in the Specification at pp. 7 and 12.

Summary of the Invention

Before considering the art rejection, Applicants will briefly review the present invention.

Applicants have discovered an improved process for making polyalkenyl sulfonic acids and the corresponding overbased sulfonates. In particular, the Applicants' invention employs a polyalkenyl sulfonic acid treatment step. This step treats the reaction product and by-products of polyalkene and sulfur trioxide (i.e., polyalkenyl sulfonic acid, sulfuric acid, recovered polyalkene sultones, and sulfur trioxide) prior to the polyalkenyl sulfonic acid being overbased in a subsequent reaction. The treatment step stabilizes the polyalkenyl sulfonic acid product and by-products by neutralizing the acid with a neutralizing agent, such as an alkaline earth metal hydroxide. This treatment step takes place within a narrow range of time (i.e., between 2 seconds and one hour) and before further processing the polyalkenyl sulfonic acid.

After the polyalkenyl sulfonic acid product has been neutralized, it is either stored for further processing (i.e., sulfonated) or immediately further processed (i.e., sulfonated). In a separate step, the "neutralized" polyalkenyl sulfonic acid is overbased with an alkaline earth metal compound.

This invention solves the problem of lower molecular weight PIB sulfonic acids and sultones that form from the sulfonic acid reaction. The inventors have discovered a process for increasing the yield of PIB sulfonic acids and a process for decreasing sultone formation.

35 U.S.C. §102(b) Rejection of Claim 24

Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. §102(b) rejection of Claim 24 as being anticipated by Harrison et al., WO 01/70830A2 ('830 Published Patent Application).

In order for a patent application to be deemed unpatentable under 35 U.S.C. §102(b), the Examiner has the burden of establishing that the Applicants' invention is anticipated in view of the cited reference(s).

In accordance with 35 U.S.C. §102(b), the Examiner must prove that the reference contains all of the elements of the claim(s) when establishing a prima facie case of anticipation. See *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379 (1986).

Applicants respectfully traverse the Examiner's rejection. It is respectfully submitted that the '830 Published Patent Application fails to disclose each and every element in Claim 24.

As presently claimed, Claim 24 teaches a process for overbasing polyalkenyl sulfonic acids consisting essentially of overbasing the polyalkenyl sulfonic acid with an alkaline earth metal basic salt and wherein water is used as a promoter. The '830 Published Patent Application incorporates by reference the general methods for preparing overbased sulfonates and other overbased products that are disclosed in LeSeur, U.S. Patent No. 3,496,105 ('105 Patent). The '105 Patent teaches that promoters include alcoholic and phenolic promoters and that water may be used in combination with the promoters in some instances to increase [the promoters'] effectiveness. See the '105 Patent at column 6, lines 15-36.

By contrast to the presently claimed invention, Examples 7 and 8 of the '830 Published Patent Application teach that methanol (i.e., alcoholic promoter) and water are used in the overbasing process. There is nothing in the detailed description of the invention or the examples of the '830 Published Patent Application that teaches that water is the only promoter used in the overbasing process. In complete contradistinction to the '830 Published Patent Application, water is the only promoter used in the overbasing method employed in the presently claimed invention.

Accordingly, the Examiner has failed to show that each and every element of Claim 24 of the presently claimed invention is taught in the '830 Published Patent Application. Applicants respectfully request that the Examiner withdraw the rejection of Claim 24 under 35 U.S.C. §102(b) in view of Harrison et al, WO 01/70830A2.

35 U.S.C. §103(a) Rejection of Claims 25-27

Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. §103(a) rejection of Claims 25-27 as being unpatentable over Harrison et al., WO 01/70830A2 as applied to Claim 24 above, and further in view of disclosures of '830.

Applicants respectfully traverse the Examiner's rejection. In order for a patent application to be deemed unpatentable under 35 U.S.C. §103(a), the Examiner has the burden of establishing that the Applicants' invention would be obvious in view of the cited reference(s).

In accordance with 35 U.S.C. §103(a), the Examiner must adhere to the following tenets when establishing a prima facie case of obviousness:

- (a) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;
- (b) there must be a reasonable expectation of success;
- (c) the prior art reference (or references when combined) must teach or suggest all the claim limitations. (See MPEP 2142)

Respectfully, the Examiner has failed to establish a prima facie case of obviousness.

Dependent Claims 25-27 of the presently claimed invention incorporate the limitations of independent Claim 24 and are directed to the overbasing process conditions (i.e., temperature, pressure and amount of water employed). Accordingly, the dependent claims claim that water is a promoter in the overbasing process. There is no suggestion or motivation in the '830 Published Patent Application to overbase a polyalkenyl sulfonic acid according to the process of the presently claimed invention. Specifically, the '830 Published Patent Application fails to teach or suggest a method of overbasing wherein water is the promoter. The cited reference teaches that water is used to increase the effectiveness of the alcoholic or phenolic promoter (see column 6, lines 15-37) and fails to teach or suggest that water is used without an alcoholic or phenolic promoter. Furthermore, the '830 Published Patent Application fails to teach or suggest the limitations of Claims 25-27, namely the amount of water, the temperature range and the pressure range, when water is the promoter used in the overbasing process. Therefore, based upon the disclosure in the '830 Published Patent Application there would be no likelihood of success in overbasing the polyalkenyl sulfonic acid as claimed in the presently claimed invention. Lastly, there is no motivation in the '830 Published Patent Application that suggests that solely water should be used as the promoter in the overbasing process.

Applicants assert that the Examiner has failed to establish a prima facie case of obviousness. Claims 25-27 of the presently claimed invention are not taught or suggested in the '830 Published Patent Application; there is no likelihood of success in obtaining the presently claimed invention based upon the '830 Published Patent Application; and there is no motivation in the '830 Published Patent Application to overbase according to the method employed in the presently claimed invention. Applicants respectfully request that the Examiner withdraw the rejection of Claims 25-27 under 35 U.S.C. §103(a) in view of Harrison et al, WO 01/70830.

35 U.S.C. §103(a) Rejection of Claims 1-23

Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. §103(a) rejection of Claims 1-23 as being unpatentable over Harrison et al., WO 01/70830A2.

Applicants respectfully traverse the Examiner's rejection. In order for a patent application to be deemed unpatentable under 35 U.S.C. §103(a), the Examiner has the burden of establishing that the Applicants' invention would be obvious in view of the cited reference(s).

The elements for establishing obviousness have been presented herein.

With regard to Claims 1-23 the Examiner has failed to establish obviousness. First, the '830 Published Patent Application fails to teach or suggest the limitation of presently presented Claim 1. Namely, the reference fails to teach or suggest the limitation that necessitates a polyalkenyl sulfonic acid neutralization step prior to further processing. Specifically, it does not teach or suggest the following: wherein the time between when the polyalkenyl sulfonic acid product leaves the first reactor and is stabilized by neutralization is between 2 seconds and one hour.

Furthermore, the Examiner even admits that the reference does not suggest a neutralization step immediately after the formation of the polyalkenyl sulfonic acid. The Examiner specifically states that "'830 does not disclose neutralizing 'as the product of step (a) exits the first reaction vessel and prior to or concurrently with entering a second vessel for further reaction or storage'" The Examiner has relied upon hindsight in concluding that the Applicants' presently claimed invention is obvious in view of the '830 Published Patent Application. "The mere fact that the prior art could be modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." In re Gordon, 733 F.2d 900, 902 (Fed. Cir. 1984). There is nothing in the prior art that teaches or suggests that the polyalkenyl sulfonic acid is neutralized within two seconds to one hour after leaving the first reactor.

In addition to the '830 Published Patent Application not teaching or suggesting the presently claimed invention, it actually teaches away from the presently claimed invention. The Examiner cited Examples 3, 7-9, 15 and 16 of the '830 Published Patent Application as being evidence of obviousness of the presently claimed invention because the examples disclose a process of making calcium polyisobutene sulfonate employing GLISSOPAL 550. The process of these examples comprises sulfonating the polymer and neutralizing the resulting product mixture with calcium hydroxide. The examples also show, and which the Examiner has failed to appreciate, that prior to the neutralization step, that the resulting product mixture is stirred at least either an hour or four hours before calcium hydroxide is added to neutralize the resulting product mixture. There is nothing in the examples that teaches or even suggests that calcium hydroxide is added to the resulting product mixture at any time less than one hour. By contrast and in complete contradistinction to the '830 Published Patent Application, the resulting product mixture in the presently claimed invention is neutralized within a time no greater than an hour of the first reaction. More specifically, the resulting product mixture (i.e., alkenyl sulfonic acid) is neutralized from between two seconds and one hour. There is nothing in the '830 Published

Patent Application that teaches or suggests neutralizing alkenyl sulfonic acid between two seconds and one hour of the first reaction.

With regard to claims 3 and 12, the Examiner has indicated that the limitations of these claims are inherent to the practices of the processes of the '830 Published Patent Application. Applicants assert that the Examiner has misapplied the inherency standard. Inherency is only applicable in anticipation (i.e., 35 U.S.C. §102) rejections. The Examiner rejected claims 3 and 12 under 35 U.S.C. §103(a) and not under 35 U.S.C. §102. "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.'" In re Robertson, 169 F.3d 743, 745 (Fed. Cir. 1999) citing Continental Can Co., v. Monsanto Co., 948 F.2d 1264, 1268 (Fed. Cir. 1991). "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." Id. at 745 (Fed. Cir. 1999) citing Continental Can Co., v. Monsanto Co., 948 F.2d 1264, 1269 (Fed. Cir. 1991). There is nothing in the Examiner's rejection that indicates that the rejection is based on anything besides a probable or possible set of circumstances.

The Examiner has failed to show that each and every element of Claims 1-23 of the presently claimed invention is taught or suggested in the '830 Published Patent Application. Accordingly, Applicants request that the Examiner withdraw the rejection of Claims 1-23 under 35 U.S.C. §103(a) in view of Harrison et al., WO 01/70830A2.

Conclusion

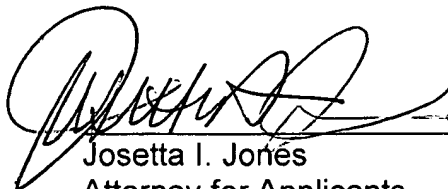
It is respectfully submitted that the Harrison reference fails to teach or suggest Applicants' presently claimed invention.

It is respectfully submitted that all of the rejections set forth by the Examiner, and the assertions made in support thereof, have been made as if Applicants' invention were included as part of the knowledge possessed by one skilled in the art. It is clearly impermissible, however, for the Examiner to use the hindsight of the present application in making these rejections, which it appears the Examiner has done. It is respectfully submitted that Applicants have shown that one skilled in the art at the time of the present invention, absent the teachings of the present application disclosure, would not choose only to view and consider the portions of the reference which the Examiner erroneously contends he would, thereby disregarding the other portions which are also set forth therein and which Applicants submit are equally as important to understanding the reference as a whole.

For the reasons stated, Applicants submit that this application is in condition for allowance and notice to that effect is earnestly solicited.

The Director of Patents is hereby authorized to charge any fees which maybe required, or credit any overpayment, to Deposit Account Number 03-1620 for the above-referenced patent application.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Josetta I. Jones', is written over a horizontal line.

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JJJ:anj
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